

ACES MAGAZINE

COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES

VOLUME 1 | SPRING 2019



GAMEON

ACES design studio creates educational technology for national, international audiences

DEAN'S LETTER

With Great Pride

With the support of a large team of faculty and staff of the College of ACES, we are happy to launch a new publication: **ACES Magazine**. It is a compilation of stories about how our work is advancing the economic and community development of New Mexico around our pillars, below. We hope that this new magazine will inform alumni and friends about the college's exciting projects.

In this first issue of ACES Magazine, you will find brief stories about some of our Extension and research activities in the state, like the 4-H program that began in Albuquerque and is now being replicated in other schools; or the food and health initiatives that are being carried out with Native American groups in the state. We also update you about the recently approved GO Bond for the modernization of agricultural and educational facilities, and introduce you to the college's 2018 distinguished alumnus.

In the magazine, we present examples of the work the college does and the impact those efforts have in the areas of food and fiber production and marketing, water use and conservation, environmental stewardships, health of New Mexicans, and education and training.

We also highlight two faculty members and their work with students: one providing a path for internships and jobs in careers related to the environment and conservation, and the other related to the training of the agriculture teachers of tomorrow.

All these examples illustrate how the college, through the academic programs, Agricultural Experiment Station and Cooperative Extension Service systems, meets real needs across the state by imparting the skills required to put knowledge into action for the betterment of New Mexico's economy and society. This is the conclusion that TEconomy Partners of Columbus, Ohio, an independent consultant group, arrived at after evaluating the work of our college. I want you to know that we appreciate your support and collaboration in giving New Mexicans a chance to improve their health, environment and economic wellbeing, and facilitate their social mobility via educational opportunities.

Whether on campus here in Las Cruces or at any of our Cooperative Extension Service or Agricultural Science Centers across New Mexico, we are always eager to share with you our successes, research-based knowledge and wide range of expertise on many topics of importance.

I hope you enjoy your first issue of ACES Magazine.



Rolando A. Flores
Dean and Chief Administrative Officer



ACES Pillars for Economic and Community Development



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CONTENTS

On the Cover

Oscar Aguirre, 6, plays a game in the Learning Games Lab in the Department of Innovative Media Research and Extension. *Photo by Josh Bachman*

The character art is for a not yet titled game that is currently in production. Each character represents a certain type of government-related effort to prevent and mitigate foodborne illness outbreaks. Funded by USDA-NIFA SPECA.



Food and Fiber Production and Marketing

Adding Value to Agriculture
Page 6



Water Use and Conservation

A Wellspring of Innovation
Page 8



Family Development and Health of New Mexicans

'Life-saver'
Page 10



Environmental Stewardship

Life After Wildfires
Page 12



Foundational Education and Training

Game On
Page 14

Also Inside

College Updates.....**2-4**
Program Profile..... **16**
Alumni Profile.....**20**



Students walk by Skeen Hall at New Mexico State University's College of Agricultural, Consumer and Environmental Sciences.

DARREN PHILLIPS

College selects Donald Conner as associate dean, director of academic programs

BY CARLOS ANDRES LÓPEZ

Donald E. Conner, department head and professor in the Department of Poultry Science at Auburn University in Alabama, will leave the South for the Southwest this spring as he begins his tenure as the new associate dean and director of academic programs for the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University.

Conner's role in the College of ACES becomes effective May 1.

"Dr. Conner's accomplishments, qualities and background match the College of ACES's plans for preparing our students for highly successful careers in their chosen fields and will propel our academic programs to new heights of success," College of ACES Dean Rolando A. Flores said. "We are delighted and looking forward to the arrival of Dr. Conner's expertise and background in benefit of ACES and NMSU students."

Conner earned a bachelor of science in environmental health science

from the University of Georgia, where he later earned a master of science and a Ph.D., both in food science with an emphasis in food microbiology.

Since 2002, Conner has served as the department head for the Department of Poultry Science at Auburn University, where he has been a faculty member since 1989. Under his leadership, the department transformed from a production-based program into an integrated poultry-food system program that is fully engaged in all land-grant mission areas.

As the associate dean and director of academic programs for the College of ACES, Conner will work with Dean Flores to administer the academic programs of the college. Additionally, Conner will be responsible for promoting academic achievement, teaching excellence and leadership, and directing the college's recruitment, retention, advising, scholarship, internship and ambassador programs.

"I am very excited to be joining the College of ACES leadership team and



COURTESY PHOTO

working with our students and faculty. I look forward to helping the college prepare the next generation of bold leaders, entrepreneurs and problem solvers," Conner said.

ACES programs address Navajo Nation 'food desert,' healthy diets

BY JANE MOORMAN

Family development and the health of New Mexicans is one of the College of Agricultural, Consumer and Environmental Sciences' pillars for economic and community development, and many departments in the college are focused on this pillar through research and Extension outreach.

This focus is especially important due to the poor health of many New Mexicans. The state is ranked 36th nationally in the 2017 America's Health Ranking, produced by the United Health Foundation.

Many factors have led to this ranking. One reason is that most of the state is a "food desert," where residents cannot easily get to stores that sell affordable, healthful foods such as fresh fruits and vegetables. Those most affected by their rural residency are Native American, especially in the Navajo Nation.

"Diabetes type-2 is a serious health problem among the Navajo people, especially its increased prevalence among youth," said Kevin Lombard, NMSU associate professor in the Department of Plant and Environmental Sciences and superintendent of NMSU's Agricultural Science Center at Farmington. "Poor access to nutritious food, departure from traditional diets and reduced physical activity are associated with a rise in type-2 diabetes and certain types of cancer among the Navajo."

ACES has two programs helping to address the lack of fresh fruits and vegetables in the Navajo Nation – the Yeego Gardening! project and the Navajos Cultivating Success Gardening program. Both programs' objectives are to improve access to fresh vegetables and to improve the ability of the Navajo people to grow food.



JANE MOORMAN

Sonlatsa "Sunshine" Jim-Martin, second from left, shows some of the corn harvested from her backyard garden to Sadie Lister, left, field coordinator for Native American Producers Success; Sharon Sandman, second from right, Highway 491 Corridor project coordinator; and Carol Palmer, Community Outreach and Patient Empowerment food system specialist. The Highway 491 Corridor project is part of the New Mexico State University Cooperative Extension Service's Market Connect project with the Navajo Nation in McKinley County.

Entering the third phase of the project, the Yeego Gardening! project has demonstration gardens in Shiprock and Crownpoint. In Shiprock it is expanding from one to six school gardens where children and their parents will learn about gardening and healthy diets.

The Yeego Gardening! project is a collaboration between NMSU, the University of Washington, Dine College and the Navajo Nation. Funding is from a partnership for the advancement of cancer research grant, involving the National Cancer Institute, the Fred Hutchinson Cancer Research Center and NMSU.

The Navajos Cultivating Success Gardening project is the second phase of a backyard gardening project along the Highway 491 Corridor north of Gallup.

"Most families in the region experience food desert situations," said Michael Patrick, NMSU Cooperative Extension Service community economic development specialist. "The project seeks to increase the availability and access to healthy food."

Gardens will be established at two senior centers, three schools and one community family's home. The gardeners will participate in seven workshops designed to increase their likelihood of success.

This project is funded with grants from the Navajo Transitional Energy Company's Community Benefit Fund, the Navajo Pride Benefit Fund and an in-kind materials contribution from the North American Coal Corporation.

GO Bond support will help expand college's impact in critical areas

BY MINERVA BAUMANN

“The college is extremely excited and greatly appreciates the support shown by voters, who in November supported the GO Bond D for Higher Education,” said College of Agricultural, Consumer and Environmental Sciences Dean Rolando A. Flores.

The portion of the bond related to college projects, worth \$25 million, will help modernize agricultural and educational facilities in the College of ACES at the Las Cruces campus. The new facilities will focus in the areas of biomedical research, food safety and security, and modern feedstuff manufacturing along with agricultural facilities and site improvements for the west end of the Las Cruces campus. Completion of the facilities is slated for the fall semester 2021.

Since approval of the GO Bond D, users of the facilities have been working through the design process.

“The next steps will be to move through the schematic design, design development and construction document phases,” said University Architect and Campus Planning Officer Heather Zack Watenpaugh.

This project is important to New Mexico and NMSU because agriculture and food processing account for about \$4 billion in sales annually in the state. This represents an important part of New Mexico's economy.



Renderings courtesy of Parkhill, Smith & Cooper

NMSU is poised to become an international leader in food protection initiatives to promote food safety in New Mexico and the region. There are also many health challenges in our region that researchers at NMSU are working to solve. Expanded infrastructure focused on biomedical research will allow researchers and students from diverse fields across NMSU to come together to offer solutions to health disparities that compromise quality of life for our stakeholders.

“Our students deserve to have the most up-to-date facilities that create

top-notch graduates for this important industry,” said Dean Flores. “We are looking to our agricultural industry partners to secure these critical investments and pledge commitments in support of these agricultural modernization and educational facilities.”

The college is reaching out to alumni and friends for naming opportunities and gifts to support these facilities. You can help expand the ACES college impact in critical areas at nmsu.life/donateACES.



COURTESY PHOTO

CES hosts first-ever NMSU Extension Dairy Training

In October 2018, agents with New Mexico State University's Cooperative Extension Service gathered in Clovis for the first-ever NMSU Extension Dairy Training, a two-day professional development training that offered a comprehensive and interactive look at the state's dairy industry.

Agents who attended the training, organized by Robert Hagevoort, associate professor and dairy specialist in the Extension Animal Sciences and Natural Resources Department, toured the world's largest cheese factory, heard presentations on topics such as dairy labor issues and workforce development, and received hands-on training in dairy safety and animal handling.

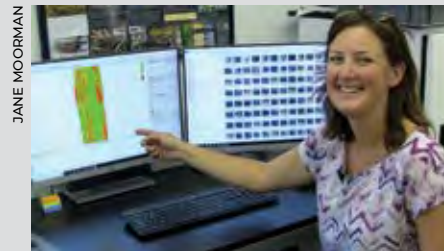
Extension in Quay County helps link new farmers to land

To help new farmers access land, New Mexico State University's Cooperative Extension Service in Quay County partnered last year with the Rocky Mountain Farmers Union Cooperative Development Center to establish a regional food-shed cooperative called the TableTop Co-op.

With assistance from the Quay County Extension Office, the new co-op launched the Land Access and Mentorship Program, a program designed to give new farmers in Quay County and surrounding areas access to land and water resources to start their own agricultural operations.



COURTESY PHOTO



JANE MOORMAN

Researchers getting bird's-eye view

Instead of having to walk a field or vineyard to observe the condition of the plants, College of Agricultural, Consumer and Environmental Sciences researchers are now using a drone with a multispectral camera that collects infrared and near-infrared spectral bands to determine whether plants are stressed by disease, pests or lack of nutrient or water. Images from the camera range from green for healthy plants, to red for stressed plants.

Miranda Kersten, senior program specialist at New Mexico State University's Agricultural Science Center at Los Lunas, displays a digital image from a multispectral camera showing the infrared and near-infrared wavelengths from plants and the surrounding ground.

Listening sessions enter third year

Agricultural leaders Rolando A. Flores, dean of New Mexico State University's College of Agricultural, Consumer and Environmental Sciences, and New Mexico Secretary of Agriculture Jeff Witte will continue their listening sessions for a third year.

“The best way to know about the agricultural issues is to listen to the stakeholders in the state,” Flores said.

The 2019 sessions began April 2 in Silver City at the Grant County Convention Center, and will continue May 30 in the Albuquerque area with the location to be announced. A third listening session will be held in Eddy County at a location to be announced. Locations and dates will be updated on the website at nmsu.life/listeningsessions.

“We look forward to meeting with New Mexico residents,” Witte said. “These sessions provide them the opportunity to engage in a face-to-face conversation with us.”



JANE MOORMAN



JOSH BACHMAN

College's second Open House a success

The college's annual Open House April 6 drew large crowds who learned about the breadth and diversity of the college at more than 60 activities and labs, more than double from the event's first year.

“The numerous tables, posters, labs and activities were a clear representation of the diversity of academic, research and extension programs we have in ACES,” said Dean Rolando A. Flores. “Adults and kids were excited learning and experiencing all we had prepared for them to explore!”

The family-friendly event took place at several of the college's buildings, labs and auxiliary units. In addition to traditional college programs, it showcased the diverse areas of focus within the college, such as wine and beer, fashion, turf research and the companion animal program known as the Fido Lab. Plans for next year already are being made for the College of ACES' third event, and other colleges at NMSU are following suit.

College of ACES student Bryce Bitsie explains his research on rumination nutrition to Dina Chacón-Reitzel, chair of the NMSU Board of Regents, in the Livestock Pavilion during the ACES Open House April 6.

ADDING VALUE TO AGRICULTURE



Clint Löest, animal nutritionist and professor of animal and range sciences in New Mexico State University's Department of Animal and Range Sciences, monitors cattle at NMSU's Corona Range and Livestock Research Center.



DARRELL J. PEHR

College to develop Center of Excellence on Sustainable Food and Agricultural Systems

BY CARLOS ANDRES LÓPEZ

Treating inflammation in livestock by supplementing their diet with capsaicin-rich chile peppers. Using industrial hemp to suppress the growth of weeds and soil-borne pathogens. These are potential examples of value-added agriculture that may become a reality as the College of Agricultural, Environmental and Consumer Sciences at New Mexico State University works to develop a Center of Excellence on Sustainable Food and Agricultural Systems at NMSU.

The center, or CESFAS, proposed by New Mexico Gov. Michelle Lujan

Grisham, will be developed in association with General Obligation Bond D, which voters passed by a margin of more than 65 percent in November 2018. The vision is to build a sustainable, vibrant food and agricultural economy in New Mexico through value-added research and education.

"Value-added agriculture will help grow New Mexico's economy," College of ACES Dean Rolando A. Flores said, "and NMSU's Center of Excellence on Sustainable Food and Agricultural Systems will be a driving force for that growth."

Natalie Goldberg, interim associate dean and director of the college's Agricultural Experiment Station, said, "Developing the CESFAS will sustain New Mexico's vibrant food and agricultural systems long into the future, and will support the College of ACES's four pillars of economic and community development."

The chile pepper-livestock research, which is ongoing, and the hemp research, which remains in the proposal stage following the legalization of the plant last year, are among the proposed areas of work for the new center. Other proposed areas include: a nutraceutical

and functional foods program; specialty markets for meat and produce; a food safety program; and a valued-added textiles program.

The chile pepper-livestock research and the hemp research will be some of the central components of the new center once in operation.

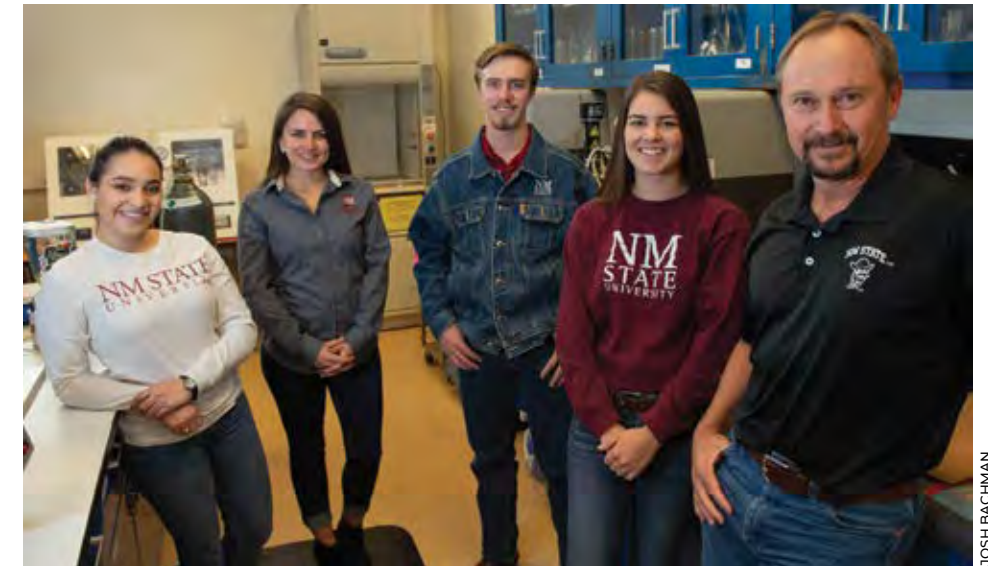
Clint Löest, animal nutritionist and professor of animal and range sciences, and his graduate students are exploring an alternative strategy to improve livestock health. Each year, diseases in cattle cost the beef industry in the United States an estimated \$600 million, and there's growing pressure from consumers to minimize drug use with alternative methods. Their research involves evaluating the efficacy of chile pepper capsaicin as an anti-inflammatory for livestock.

"If capsaicin is effective at reducing inflammation," Löest said, "then supplementing livestock diets with chile peppers could reduce traditional anti-inflammatory drug use and increase the market for culled chile peppers by \$10 million annually, a win-win situation for the chile pepper and livestock industries."

The current research builds on previous value-added agriculture studies involving chile peppers and livestock. In a 2004 study, NMSU researchers found that cows preferred a diet containing 20 percent chile pepper byproducts over a corn silage-based diet without chile.

Chile pepper byproducts, such as culled pods, peels, veins, leaves, seeds and stalks, offer many benefits. They're highly nutritious, containing more protein and minerals than corn silage, a major source of feed for dairy cattle in New Mexico, and they're widely available at little to no cost. Nationwide, the process of peeling, deseeding and deveining chile peppers yields more than 30 million pounds of byproducts every year.

As for the current research, Löest and his students are still exploring ways in which capsaicin can be used to treat inflammation in ruminants. Similar studies have shown success in non-ruminants, Löest said, but animals with rumens, such as cattle, present different challenges.



JOSH BACHMAN

Clint Löest, animal nutritionist and professor of animal and range sciences, and his graduate students are exploring an alternative strategy to improve livestock health. Their research involves evaluating the efficacy of chile pepper capsaicin as an anti-inflammatory for livestock. Pictured here, from left, are Francesca Lopez, Mary Catey, Logan Klump, Cheyanne Mercier and Clint Löest in a laboratory in Knox Hall.

"We've done two or three studies already, but we could not duplicate what they found in non-ruminants," he said. "We discovered it's possibly because the rumen is destroying the capsaicin. We have to now rethink how we're going to protect the capsaicin that's in the chile."

NMSU researchers also plan to study the value-added properties of hemp at the new center of excellence, following the plant's legalization in 2018.

Earlier this year, researchers outlined their hemp research and education proposals in a white paper. The report identified five areas of hemp research expertise and interests and called for the development of a comprehensive Hemp Research and Extension Center at NMSU, projected to cost an estimated \$9.1 million over four years.

The areas of interest included a value-added agriculture component.

"Hemp could have many practical uses throughout New Mexico," Dean Flores said. However, he stressed that hemp research at NMSU would not happen immediately because it needs funding.

"The College of ACES has the capabilities and the expertise to help industrial hemp producers in New Mexico become profitable and sustainable, but we will need to fund our research," he said.

Still, there's enthusiasm about hemp's potential in value-added agri-



JOSH BACHMAN

The Center of Excellence on Sustainable Food and Agricultural Systems plans to conduct research on hemp that will help industrial hemp producers in New Mexico become profitable and sustainable.

culture. In the proposal, researchers said NMSU could help producers maximize use of the entire plant and extract useful proteins, oils and antioxidants from the seeds. Hemp proteins, for example, could be used in functional foods, nutraceuticals and extruded snacks and aquaculture feed.

Among other applications, hemp also could help absorb heavy-metal from soil and suppress weeds and soil-borne pathogens. Additionally, hemp could be an excellent source of protein, making it a competitive alternative with ethanol industry co-products and animal byproducts.

NMSU also hopes to identify hemp industries with the greatest potential for economic profitability and sustainability, and help producers understand potential costs and returns associated with hemp production, according to the proposal.

A WELLSPRING OF INNOVATION

College researchers test new water conservation practices BY DARRELL J. PEHR

When Sangu Angadi was traveling to his science center office in Clovis one spring day, he was engulfed in the dust of a prairie windstorm. As a crop scientist, Angadi had a pretty good idea of the source of the dust – fallow fields that had dried to powder over the winter months. What he learned later would spur him into seeking new solutions to this decades-long, and worsening challenge.

Soon after returning to New Mexico State University's Agricultural Science Center at Clovis, Angadi heard on the news that some people had been killed in a West Texas traffic accident caused by the low visibility conditions in the same storm. As he weighed the conditions that led to the deadly storm, an idea came to mind that promised numerous benefits, and the possibility of perhaps saving lives in the future.

The dust storm consequences added a new level of urgency to Angadi's work in the College of Agricultural, Consumer and Environmental Sciences to study new ways to use water more efficiently, especially in the Great Plains where heavy use of ancient water trapped in the Ogallala Aquifer had depleted the underground water level much faster than it was being recharged by rain and melting snow.

Angadi, a professor of crop stress physiology, had an idea that was simple yet innovative: why not create special, non-irrigated "circular buffer strips" within the irrigated fields in Eastern New Mexico and West Texas? With center-pivot irrigation systems widely used in the area's farmlands, such buffer strips could provide protective conditions to shield young plants from wind and con-

serve water. Reduced water availability in recent years had caused many farmers to irrigate only two-thirds of their fields, with a third left fallow. Those fallow areas seemed like an ideal opportunity for the buffer strips project.

A field trial was established by Angadi and his researchers at the Clovis Science Center in August 2016. The field includes five buffer strips among the pivot's crop circle. Each 30-foot-wide buffer strip alternates with a 60-foot-wide crop strip. Six native perennial grasses – two cool season and four warm season – were planted and sensors were installed.

Angadi knew that reintroduction of perennial grasses to the Great Plains fields would bring many benefits, such as improved productivity, biodiversity, soil quality and organic matter content and better water infiltration and water holding capacity. The grasses helped reduce wind speed, evaporation, wind and soil erosion, sandblasting and runoff, and improved rain and snow capture and the climate conditions, or "micro-climate," closely surrounding the crop.

A very practical benefit of the buffer strips is increased access to the fields by heavy equipment for maintenance of the irrigation pivot itself and reduced well pressure problems.

Angadi has observed an improved water cycle, biodiversity, increased productivity, carbon sequestration and reduction in withdrawal from the Ogallala aquifer.

"Producers, researchers and private companies are excited with the concept," Angadi said. "One farmer has planted circular grass buffers in three circles and many more are thinking of trying this method."



Professor Sangu Angadi, crop stress physiologist for the College of ACES, gives participants at a recent field day an update on research projects at the college's Agricultural Science Center at Clovis. One area of focus for Angadi and his team is the establishment of special, non-irrigated "circular buffer strips" among the irrigated fields in Eastern New Mexico and West Texas.



The arm of a center pivot irrigation system stretches from the center of a field toward the horizon. Dwindling water availability in recent years had caused many farmers to irrigate only two-thirds of their circular fields, with a third left fallow. To college researchers, those fallow areas seemed like an ideal opportunity for the "buffer strips" project.

Angadi said the technique creates good habitat for wildlife and the project offers a unique ability to train graduate and undergraduate students in multidisciplinary studies. The project is funded by a U.S. Department of Agriculture National Institute of Food and Agriculture Foundational Grant.

Also at the Clovis Science Center, researcher Rajan Ghimire is looking at innovative ways to improve agricultur-



Perennial grasses thrive in a "buffer strip" established within an irrigated field in Eastern New Mexico. With center-pivot irrigation systems widely used in the area's farmlands, such buffer strips could provide protective microclimates to shield young plants from wind and conserve water.

al production, with a focus on the soil health of the area. Ghimire, an assistant professor in the Department of Plant and Environmental Sciences, leads a team that is evaluating cover crops, conservation tillage systems and crop residue management practices intended to minimize soil organic carbon loss and improve nutrient cycling, soil health and water conservation in the area's dryland and limited-irrigation cropping systems.

Regarding the alteration of tillage practices, Ghimire said, "Research on conventional tillage, strip-tillage and no-tillage comparison in dryland situations shows the many benefits of reducing tillage. Specifically, no-tillage in dryland corn-sorghum rotations has increased soil water storage, reduced soil erosion and maintained comparable crop yields."

Ghimire and his team also are studying how cover crops, crop rotation and diversification and the input of biomass carbon can increase efficiency of water use. The researchers' ultimate

focus is on meeting global food production needs while minimizing the impact on the environment and ensuring long-term environmental and economic sustainability of global agriculture. They hope to improve overall soil health, reduce greenhouse gas emissions from farmland and improve water use and conservation efficiency.

Funding for Ghimire's work comes from USDA-NIFA as well as the USDA's Natural Resources Conservation Service.

In an area of New Mexico where a history of high crop production is being threatened by a declining source of water, these and other College of ACES

researchers are using innovation, dedication and know-how to help move from concern to confidence in the economic viability of agriculture in the region.



Assistant Professor Rajan Ghimire speaks with a producer during a recent field day at the college's Agricultural Science Center at Clovis. Among several projects, Ghimire and his team are studying how cover crops, crop rotation and diversification, and the input of biomass carbon can increase efficiency of water use.

'LIFE-SAVER'

Extension helps New Mexicans manage chronic conditions

BY CARLOS ANDRES LÓPEZ



Sonja Koukel, left, associate professor in the College of Agricultural, Consumer and Environmental Sciences and health specialist for Extension Family and Consumer Sciences at New Mexico State University, and Lourdes Olivas, NMSU Extension associate, are part of a team that administers the Chronic Disease Self-Management Education Program on behalf of NMSU's Cooperative Extension Service.

In the United States, 6 in 10 adults have a chronic disease, according to the Centers for Disease Control and Prevention. In New Mexico, two of the state's top health priorities aim to reduce and prevent chronic diseases such as obesity and diabetes, while another aims to curb smoking.

With the rise in chronic disease, health care spending in the U.S. is soaring. In 2017, 90 percent of the nation's \$3.3 trillion health care expenditures came from patients with chronic and mental health conditions, according to the CDC.

At New Mexico State University, Sonja Koukel sees firsthand the effects of chronic disease on New Mexico residents.

Koukel, an associate professor in the College of Agricultural, Consumer and Environmental Sciences and health specialist for Extension Family and Consumer Sciences, oversees the Chronic Disease Self-Management Education Program on behalf of NMSU's Cooperative Extension Service.

Koukel leads a dedicated team that has helped hundreds of New Mexico residents manage their chronic conditions over the past nine years.

CDSMEP is an evidence-based, peer-led intervention that was initially offered by the Stanford Patient Education Research Center but is now available through the Self-Management Resource Center. The program is designed to empower people with chronic illness to build the necessary skills to manage their health. The six-week program addresses challenges associated with chronic conditions, such as pain management, nutrition, medication use, emotions and communicating with doctors.

A study by the National Council on Aging found that CDSMEP resulted in better health, better care and lower health care costs among participants who completed the six-week program. The evaluation of the program also revealed that participants improve communication with their health care provider, had fewer

emergency room visits and improved their physical activity.



NMSU Cooperative Extension Service program coordinator Gabriel Calderon, far right, and participants gather after a class in the Chronic Disease Self-Management Education Program in Las Cruces.

emergency room visits and improved their physical activity.

Since 2011, 906 New Mexico residents have completed CDSMEP and related programs through NMSU, resulting in a potential economic impact of \$646,884 in reduced health care costs.

Under Koukel's leadership, the Cooperative Extension Service offers a general Chronic Disease Self-Management Program and three other programs that fall under the CDSMEP umbrella: the Diabetes Self-Management Program; Cancer: Thriving and Surviving Program; and Chronic Pain Self-Management Program.

Since 2016, NMSU's Cooperative Extension Service has been sub-contracted through the New Mexico Department of Health to facilitate the program, a move that has expanded the outreach of CDSMEP in New Mexico.

From November 2016 to July 2018, 101 people completed the CPSMP and DSMP programs through the Cooperative Extension Service. The completion rate for participants is 76 percent.

"This program is a great example of how the College of ACES works to improve the health and quality of life of New Mexico residents through evi-

dence-based intervention," Koukel said, noting one of the college's four pillars of economic and community development.

One past participant described the program as a "life-saver." Another person said, "The workshop has enabled me to make lifestyle changes that are starting to have an impact on my life."

Koukel and her team, which includes Gabriel Calderon, program coordinator, Lourdes Olivas, Extension associate, and Beatriz Favela, Extension Family and Consumer Sciences agent, administer the program based on need and ability to fill classes throughout New Mexico. The program is taught in English and Spanish and is free to participants.

The program includes six, two-and-a-half-hour workshops that are held once a week for six consecutive weeks. It is taught by facilitators who have completed CDSMEP leaders' training through the Cooperative Extension Service. Twenty-six program leaders completed training between November 2016 and July 2018.

Olivas, who trains program leaders, described each workshop as an interactive learning environment with a friendly group atmosphere. Each workshop covers a different topic such as pain



Gabriel Calderon, program coordinator for the NMSU Cooperative Extension Service, holds a nutrition diagram before the start of a class for the Chronic Disease Self-Management Education Program.

management, exercise, nutrition and meditation, among others.

"Our participants create friends, and they realize they're not living with a chronic condition by themselves," Olivas said. "Our approach allows participants to open up and not feel isolated."

Olivas said participants set a goal each week and report back to the group on their success. This helps participants become more accountable, she said.

"Participants are motivated to meet their goals," she said, "because when they come back, they don't want to let themselves down and they don't want to let the group down." When classes end, participants often tell Olivas that they don't want to stop coming because they value the class so much.

To learn more about the CDSMEP at NMSU, visit nmsu.life/CDSMEP.

“ This program is a great example of how the College of ACES works to improve the health and quality of life of New Mexico residents through evidence-based intervention.” -**Sonja Koukel**

LIFE AFTER WILDFIRES

Researchers work to restore fire-damaged forests BY JANE MOORMAN

Catastrophic wildfires in the Southwest in recent years have impacted approximately 118,000 acres of federal forest lands in New Mexico and Arizona. The damage is categorized as high burn severity, according to a white paper by the U.S. Forest Service.

New Mexico State University's College of Agricultural, Consumer and Environmental Sciences is actively involved in researching many aspects of these fires' impact.

As various federal and state agencies work to prevent future catastrophic fires with prescribed burns and thinning of the remaining forests, other agencies and groups are developing a plan for the restoration of the large-scale fire areas.

James Cain, an affiliated faculty with the college's Department of Fish, Wildlife and Conservation Ecology, is answering the question of how the fires, both prescribed and high severity devastation, and thinning of forests impacts the wildlife habitat of the Jemez Mountains and Valles Caldera in northern New Mexico.

Owen Burney, NMSU associate professor and superintendent of the John T. Harrington Forestry Research Center in Mora, is researching how to restore the forest habitat throughout New Mexico and Arizona.

"We're specifically looking at how mule deer, elk, black bears and mountain lions are responding to the aftermaths of these situations," Cain said of the study, which is funded by a U.S.

Forest Service and National Park Service grant. "We usually have 10 to 20 bears, about 50 elk and about 10 to 15 mule deer with GPS collars at any given time allowing us to see where they're moving throughout the landscape."

Analysis is still being conducted on the data that has been collected.

"We have some early findings for the mule deer and elk, as well as the black bears," said Cain, who is the assistant leader of the U.S. Geological Survey's New Mexico Cooperative Fish and Wildlife Research Unit. "So far what we've found is that the elk are really responding to the wildfire burned areas, because they like the new grass growth."

The mule deer avoid the wildfire areas completely after the fire, likely due

to the reduction in browse. They will visit prescribed burn areas, particularly those burned within the previous two years. Deer select thinned areas, but only those thinned more than five years previous, once the shrubs have grown back. They avoid more recently thinned areas.

Thinning and wildfires also have the potential to disturb black bear bed and den site selection.

"We found horizontal cover or security cover the biggest driver for the bears' selection of bed sites where they rest during the middle of the day," Cain said. Researchers found bear bed sites in areas that were too rocky or too steep for thinning crews.

The researchers found similar patterns for den sites.



Joshua Sloan, post-doctoral researcher at NMSU's John T. Harrington Forestry Research Center at Mora, measures the soil moisture in seedling nursery containers. Researchers at the center are using drought-conditioning techniques from the time of germination to prepare seedlings for planting in harsh, dry environments.

Burney is working with forestry professionals in the Southwest, including the U.S. Forest Service, The Nature Conservancy, Forest Stewards Guild and Northern Arizona University. The goal is to develop strategies to put the forest back on the right trajectory after a fire, and work to ensure the forest is resilient to future fire conditions.

"We are developing a nucleation strategy where tree islands, or small planting plots, will be replicated in natural patterns across the landscape," Burney said. "The area between these islands can be seeded with native grasses and shrubs. In the long-term, these gaps will begin to fill in with native trees from mature trees within the established tree islands."

One of the first issues the foresters are facing is the huge number of seedlings needed to restore these U.S. Forest Service burned forested areas – between 30 and 60 million. This number increases each year with every new forest fire.

"NMSU's Mora facility has the largest forest tree seedling nursery in New Mexico that is producing seedlings for restoration," Burney said. "Our production capacity is 270,000 seedlings per year. There is a large gap in both nursery capabilities and overall planting efforts to address the growing planting deficit to restore these landscapes."

The second part of the seedling issue is survival rate once planted. Historically, seedlings that thrive in the nursery have had an average survival rate of 25 percent in the field. Many things play into the lack of survival, including growing and planting techniques, climate and precipitation, temperatures and animal activity in the area.

Another aspect of the lack of survival is that the nursery seedlings are physiologically not ready for the harsh environment where they are planted.

"Usually after the fires, the Southwest environments are dry and difficult to get plants established," he said. "The traditionally grown seedlings struggle."

At Mora, a nursery cultural practice of "tough love," or stress conditioning, has been used while growing the seedlings. "By decreasing the irrigation in the nursery, plant hydraulics are altered to provide improved water conduction in the xylem (the vascular tissue in plants that conducts water and dissolved nutrients upward from the root and also helps to form the woody element in the stem) as well as a buffer against drought stress," he said. "In the field we are seeing an increase in both growth and survival of these conditioned seedlings."

Character art for a not-yet-titled game that is currently in production. Each character represents a certain type of government-related effort to prevent and mitigate foodborne illness outbreaks. Funded by USDA-NIFA SPECA.



GAME ON

ACES design studio creates educational technology for national, international audiences BY ADRIANA M. CHÁVEZ

Visitors walking into the Learning Games Lab inside Gerald Thomas Hall on the New Mexico State University campus will initially notice what looks like a small group of video game designers quietly working on designs and codes for the next hit video game.

In reality, they're working on several games and projects, sometimes up to 20 at a time, that will help users across the country learn more about various topics ranging from food safety to math to how government works.

The Learning Games Lab is part of the Department of Innovative Media Research and Extension in the College of Agricultural, Consumer and Environmental

Sciences. The department's games, videos and apps have been accessed more than 92 million times since 2011, including more than 60 million views on YouTube and 6.3 million gameplays on the web in 2018 alone. Faculty in the department

collaborate with experts across the U.S. to create educational tools not only for K-12 and college students, but also for adult learners and industry professionals. Each project is research-based, and most projects are funded by grants.



Amanda L. Armstrong, right, Learning Games Lab session coordinator, demonstrates how the team in the lab would observe children as they test out new games and software, with the help of Oscar Aguirre, 6, who was testing out one of the lab's prototype exercise-related games.

In 1982, Innovative Media Research and Extension department head Jeanne Gleason started producing videos in the department, creating a new focus on digital media for Extension and the college.

"Our impact has really been global, as we've continued development with touch-screen kiosks, websites, animations, games and apps," Gleason said. "I never imagined we would be reaching so many different people with so many different kinds of educational content."

The lab also offers several week-long learning programs as part of their outreach and research. Recently, they worked with the iThrive Organization training high school students to pitch ideas for games based on the problems they want to solve in the world. The project gives students a glimpse into game development and design while helping them demonstrate empathy toward difficult topics such as mental illness, suicide and self harm. Their work is being expanded to a curriculum for use nationwide in high schools.

Other games lab programs give learners a chance to create other types of media, and provide feedback on games, animations and virtual labs developed by the studio.

"The game lab participants are identifying a change and exploring how you create that change, just as our game

designers do," said Amanda Armstrong, Learning Games Lab session coordinator and a doctoral student in the Department of Curriculum and Instruction at NMSU. The lab is also working on several other projects, including an app for tasting behaviors and physical activity aimed at pre-school children, a Navajo Rangeland app for identifying plants in English and Navajo, and a project involving a series of interactive labs that will help children learn about water reclamation. They've recently completed a series of tools to help college students explore how chemistry is related to agricultural sciences.

Later this fall, they'll release a game on the different branches of government and the role each plays in preventing health outbreaks, such as those related to foodborne illness. They will soon begin work with other partners in the College of ACES to create new learning tools on insect science, and with partners in other Extension programs to create learning tools for youth on the risks

of electronic tobacco products.

"Sometimes we'll have 15 to 20 projects on rotation, but we're working on eight projects now," said Pamela Martinez, who oversees the production of games, websites and digital media for Innovative Media Research and Extension.

One of the projects that is

Find our games at learninggames.nmsu.edu

most commonly associated with the Learning Games Lab is Math Snacks, a suite of games, animations and teaching materials funded by the National Science Foundation that focuses on often misunderstood math concepts for students in grades 5-8. Research has found that games make a significant impact on students' understanding of math concepts when the games are added to classroom instruction. Between 2015 and 2018, Math Snacks has had 15.6 million views and plays.

Developing games isn't the only focus of the Learning Games Lab. It also explores how technology can garner the best user experiences. For example, two summers ago lab staff and faculty worked with Facebook developers on their popular Messenger app to help design the best social experiences for children.

"We're a nonprofit design studio based on university research," said Barbara Chamberlin, director of the Learning Games Lab. "Research tells us what content we need to address, how to best design the tools we create, and the impact of what we've developed."

For more information about the Department of Innovative Media Research and Extension, visit learninggames.nmsu.edu.



Adrian Aguirre, left, an artist and animator in the Department of Innovative Media Research and Extension, talks with Frank Eshelman, center, a software developer and programmer at the lab, about a game they are working on.

TAKING THE NEXT STEP

Programs help students prepare for careers in natural resources

BY MELISSA RUTTER

Over 200 students so far have received an extra helping hand to better prepare themselves for their future. This is thanks to two Natural Resources Career Track programs that have received funding from the U.S. Department of Agriculture.

The initial program, the New Mexico-Puerto Rico Natural Resources Career Track Program, received a \$4 million grant and included seven institutions in New Mexico and seven in Puerto Rico. Students worked alongside agency partners, such as the USDA Forest Service and the Natural Resources Conservation Service. Over 200 internships were received, 80 students received faculty research mentorships and 83 percent of the students have gone on to jobs with the USDA or graduate school.

The program enabled some students to move between the Island of Enchantment (Puerto Rico) and the Land of Enchantment (New Mexico), where stu-

dents took classes through the National Student Exchange at a partner institution for a semester or a summer internship.

Martha Desmond, Regents professor in the department of Fish, Wildlife and Conservation Ecology at New Mexico State University, said these programs help students start thinking about why they're in this field, what they want to do and where they see themselves in a few years.

"Students actually have a plan related to what they want to do and we see them move into graduate school or positions with natural resource agencies," Desmond said.

The current program, which is entering its fourth year, is the Southwest Natural Resources Career Track Pro-

gram. The program was funded by a \$2 million grant. The program is similar to the collaboration with Puerto Rico, but this time works with different universities across the Southwest.

"With our new grant, it is a little harder because of the political climate – there are fewer jobs especially permanent positions in the federal government for students to pursue," Desmond said. "Our new collaboration includes Northern New Mexico College, New Mexico Highlands University and Sul Ross State University. We have worked collaboratively with NMHU for many years but NNMC and SRSU are new collaborations. We also do outreach to community colleges and local high schools."

Students participate in a field course at the Appleton-Whittell Research Ranch of the National Audubon Society in the summer of 2017. The 8,000-acre ranch is in southeastern Arizona.



COURTESY PHOTO



COURTESY PHOTO

The New Mexico Department of Workforce Solutions hosts its mobile unit on campus each fall to target career advice, internship and permanent job opportunities with the USDA Forest Service. Ninety-seven internships across seven agencies including 15 with the USDA Forest Service have been received by students in the Southwest Natural Resources Career Track program so far.

Desmond said they send students to conferences where they learn to network. Many students are involved in research mentorships where they work with faculty and graduate students. These students also present research results when they attend conferences.

All students are required to have an internship or research experience each

summer so they are guided in the application and interview process. All students are exposed to workshops related to USAJobs (the federal job portal), the PATHWAYS program (federal student hiring program), other internship sites and resume workshops. An annual retreat is hosted for all program students, faculty and federal partners each spring. The most recent retreat was a two-day meeting at the Ghost Ranch in Abiquiu, New Mexico.

"These opportunities give students the networking and research experience that will help them start thinking about their future," Desmond said.

Odilia Garcia, program coordinator for the SWNRCT program, meets with students from each university every semester to see how they are doing, assess their progress and discuss what plans they have moving forward. She also has bi-weekly video chats set up with student ambassadors across institutions to organize activities. Garcia also does outreach events with schools.

"In addition to high school outreach, our student ambassadors have also been working with elementary school students and they absolutely love the outreach we do. We take specimens from our wildlife museum to show them what they are and it's just been great," Garcia said.

Desmond explained it's important to do outreach events because many students in high school and community college have not been exposed to opportunities in these fields. The outreach events may help them make decisions about academic majors and potential careers.

Desmond said opportunities received and the skills learned through the SWNRCT program will help launch students into the career and graduate school path they are looking for in the natural resources field.

"Learning soft skills, understanding the process of getting a federal or a non-federal job and being ready for graduation with internships and references in addition to a good academic record makes them attractive to graduate programs and employers," Desmond said. "Entry positions with the federal agencies are gateway positions. These students are capable of moving into supervisory positions with an agency or research positions as soil scientists, wildlife ecologists or range ecologists as they move forward and pursue a master's degree or Ph.D."

For more information on the Department of Fish, Wildlife and Conservation Ecology, please see nmsu.life/FWCE.



COURTESY PHOTO

In February 2016 the Southwest Natural Resources Career Track program hosted a U.S. Department of Agriculture conference on workforce diversity. New Mexico State University students, faculty and staff join College of Agricultural, Consumer and Environmental Sciences Dean Rolando A. Flores (back row, center) at the conference.

A FOCUS ON STUDENT SUCCESS

AXED assistant professor mentors, guides future ag teachers

BY ADRIANA M. CHÁVEZ

Growing up in North Carolina, Tre Easterly wanted to pursue a career in turfgrass management. He was attracted to the idea of working outside and making a golf course a beautiful place.

But after becoming involved in FFA and his high school's agriculture education program, and after learning that managing a golf course doesn't always mean being outdoors, Easterly decided to become an ag teacher.

"As an ag teacher, I never look forward to a Friday, and I never dread coming to work on a Monday," Easterly said while sitting in his classroom at Gerald Thomas Hall.

Easterly, an assistant professor in the Agricultural and Extension Education department in the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University, has quickly developed a reputation for his strong mentoring and leadership skills during his three years at NMSU. His students describe him as demanding in the best possible sense, and say they like the way he treats failure as a learning experience but expects nothing but the best results.

"I was kind of a lost kid in high school when one of my friends asked me to go to an FFA meeting, and that was the first time I felt like I belonged



Tre Easterly, left, an assistant professor in the Agricultural and Extension Education department, talks with students Carolyn Fisk, right, and Halee Prather, center, in Gerald Thomas Hall.

somewhere," said Carolyn Fisk, a senior AXED major focusing on teaching. "When I started at NMSU, I almost changed my major, but I started taking classes with Dr. Easterly and I decided to stay. He's very persistent and he's definitely pushed me to be successful. He gets to know you and doesn't let you make excuses."

Easterly's teaching focuses on giving students opportunities to apply

their learning in real world settings and giving them feedback on how they performed. His teaching methods course culminates with students teaching a lesson at a New Mexico high school, implementing the methods they learned throughout the class.

"To make my students successful, I should encourage them to ask why they are doing what they are doing and to work to get better every day," Easterly

said. "This can be done through clearly communicating high expectations, and never apologizing for holding students to those expectations."

Easterly earned a bachelor's degree in agricultural education from North Carolina State University, and a master's degree in agricultural education at the University of Florida. After earning his master's degree, he was an agriscience teacher at two high schools over three years, then earned his Ph.D. in agricultural education from the University of Florida in 2016.

After earning his doctorate, Easterly cast a nationwide net looking for a place where he could make a difference as an agriculture teacher educator. That university was NMSU.

"I really love teaching, and I thought the most difference I can make

is to be a teacher educator," Easterly said. "NMSU has been a good fit for me professionally."

During the fall semesters, Easterly spends much of his time traveling New Mexico supervising student teachers. This has also allowed him to make connections with teachers and administrators at New Mexico middle and high schools. In the spring, Easterly teaches three courses on campus.

Easterly said that if a student fails, he's there to help pick them up and dust them off, something Halee Prather, a junior AXED major with a focus on teaching, agrees with.

"If it wasn't for him, I wouldn't be as prepared as I am now to start student teaching," Prather said. "I'm glad I have the confidence and knowledge, and

Dr. Easterly has taught me to never settle for less than what you expect for yourself."

Ashlea Gideon, also a junior AXED major focused on teaching, said she has taken courses with Easterly for the past three years, and views him as taking up where her high school ag teacher left off.

"My high school ag teacher was great at what she did and she was passionate about ag," Gideon said. "Dr. Easterly is also super passionate about what he does and I'm really impressed. He's introduced me to a lot of new ideas and methods and strategies. He's always open to our questions and helps us focus on why we're doing what we're doing."



JOSH BACHMAN



COURTESY PHOTO

HELPING THE NEXT GENERATION

Distinguished Alumnus Rance Miles shares his success with students BY MELISSA R. RUTTER

After working his way through college as a livestock feeder at the New Mexico State University campus farm, Rance C. Miles graduated with a bachelor's degree in 1980. Miles now finds himself as chief financial officer and chief operating officer of Select Milk Producers, Inc., one of the nation's leading cooperatives made up of dairy farmers committed to high-quality milk and animal care comfort.

Miles has a strong connection to NMSU with many friends and family attending and with his involvement with the university. Miles was recognized by the NMSU Alumni Association as the

2018 Distinguished Alumnus for the College of Agricultural, Consumer and Environmental Sciences.

He credits his family's support and encouragement for helping him to get through college.

"Kids can't get through college on their own, it takes a family's commitment. I'm not talking about if a family has money or not, I'm talking about all the support and encouragement they give," Miles said. "My family did not have money. Scraping together \$350 a semester was a challenge. Extended family would send me a \$50 check here and there to help me out, but the bigger

message was they believed in what I was doing and they believed that college was worthwhile. The check was just a monetary acknowledgment of that."

With that in mind, Miles has committed himself to support the Aggie Finish Line scholarship and the NMSU chapter of the National Agri-Marketing Association. Miles made a five-year commitment of \$25,000 a year to the Finish Line scholarship and even put down another \$25,000 the first year to match donations that were collected. This will be his second year supporting the scholarship fund.

"The Aggie Finish Line Scholarship intrigued me. I understood it as being



COURTESY PHOTO

for people that are close to the finish line, but have just exhausted all their resources from their family and scholarships," Miles said. "Most of those kids are working a job or two and they finally get to the point where they are just out of gas, the financial tank is on empty and everyone has run out of money."

"All of us want to know that when we are attempting to do some good with our contributions that we can see some good being done," Miles said. "This scholarship just seemed like a very laser-focused and a beneficial scholarship to pitch a lifeline to those people who are just in the last leg of the race there."

It was Miles' son Trevor who brought his attention to NAMA. Now, six or so years later, Miles is still an avid supporter of the organization. NAMA prepares students for careers in agribusiness marketing, sales, public relations and advertising. Activities done include field trips, work experiences, a yearly resume workshop and the annual national marketing plan competition. They are also involved in volunteer and community services.

"My son got an ag business degree and a second degree in marketing and what I saw him doing in that NAMA organization was so applicable to what students will be doing when they get out in the workforce. All of the things I saw us doing in our company were being done in NAMA and the competition they go into is so real life," Miles said.

"My son went to work and was immediately able to apply everything that he did in NAMA," Miles said. "How often do we find students with the opportunities to go, 'Hey, I've done that, not the textbook stuff and theories, but the actual thing. I understand more than others.' From a guy who might be hiring, something like this is great. They're going to have a leg up on people. So, once I understood what they were doing, I knew I had to get involved."

If you are interested in supporting students via scholarships, visit nmsu.life/ACESscholarships.



CHRIST CHAVEZ

The 2018 recipients of the New Mexico State University Alumni Association awards include Tommy Sheppard (second from left), Tara Jaramillo, Patty Lopez, Rance Miles, Dion Messer, Rebeccah Brown and Eric Powell. They are joined by Scott Sponseller (far left), president-elect of the NMSU Alumni Association, and Chancellor Dan Arvizu (far right).

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4-H program helps Albuquerque school improve learning, attendance BY JANE MOORMAN

Albuquerque Public Schools principals are turning to the 4-H Youth Development program to spark students' success. Eight schools are implementing programs to help students.

Collet Park Elementary School principal Stephani Treadwell was looking for a way to provide experiential learning opportunities for her school's students when she contacted New Mexico State University's College of Agricultural, Consumer and Environmental Sciences' 4-H Youth Development program in Bernalillo County.

"Our students were not retaining the information they had been proficient in the prior week," Treadwell said. "We realized that new information is retained when it is connected to knowledge that is already gained through an experience. The majority of our students live in poverty and have not had a wide variety of experiences to link classroom learning to."

When Treadwell did an Internet search on experience and learning, the first item listed was 4-H and experiential learning.

The educational administrator contacted NMSU's Cooperative Extension Service office in Albuquerque and a successful collaboration began.

4-H agents Brittany Sonntag and Nicole Jacobs helped Treadwell develop a plan to integrate 4-H curriculum into her school.

"We believe Collet Park Elementary is the first school in the nation to implement the 4-H club model and curriculum during the school day," Sonntag said. "The results are amazing."

"We dove into the 4-H curriculum and we love it," Treadwell said. "We implemented school-wide 4-H clubs in 2016, with the addition of teachers using subject kits in their class curriculum the following year."

The success of "4-H in the School" is evident in the students' performance on the Partnership for Assessment of Readiness for College and Careers testing during the 2017-2018 school year.

"The second year we began seeing a huge growth on our monitored monthly testing," Treadwell said. "The kids had a 16 percent proficiency in lan-



Collet Park Elementary School third grade student Gavin Bendall is learning to weave during one of the school's Friday afternoon 4-H clubs. Every student at the PreK-5 school attends a 4-H club if they have completed all of their homework for the week.

guage arts at the end of the year and the next year they were 47 percent proficient."

Collet Park Elementary's chronic absenteeism has also decreased, from 23 percent to 7 percent.

"We have seen students tell their parents, they don't want to miss school, especially leaving early on Friday afternoon, because they want to participate in the 4-H club activities," Treadwell said.

The year before starting the program, Treadwell said the school averaged a couple of suspensions a month. This year she has had no suspensions.